

# Cerebral echinococcus that can be confused with brain tumour: a case report

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## Abstract

*Echinococcus* is a parasitic disease known as echinococcal zoonosis and is often caused by *Echinococcus granulosus*. Cerebral echinococcus is extremely rare and has been reported to be less than 1% in the literature and it is more common in the childhood age group.

In the case we are going to present, the patient is an 83-year-old male who was admitted to our clinic with complaints of headache and forgetfulness. The patient, who was initially thought to have a brain tumour, was pathologically diagnosed as echinococcus after surgery. In our case, in addition to the characteristic features, diagnosis and treatment of echinococcus, the rare cerebral metastatic form was also tried to be explained.

*Echinococcus*, which is frequently encountered in the visceral organs, is most common in the liver, but cases in the brain are very rare. The surgery is the first treatment method of the cerebral form of echinococcus. We must keep the follow-up of patients in the postoperative period due to recurrence of this zoonotic disease.

If we live in an endemic area and the patient has a history, cerebral echinococcus should definitely come to mind in patients with brain tumours. Especially, it should be kept in mind that alveolar echinococcus has a malignant course and it should be followed up postoperatively.

**Key words:** cerebral hydatid disease, zoonotic disease, alveolar hydatid cyst.

## Introduction

The hydatid cyst is a zoonotic disease often caused by *Echinococcus granulosus*. Although a liver hydatid cyst was recognized by Hippocrates, the name Echinococcus was first used by Rudolphi in 1808. Alveolar echinococcus is another type of echinococcus that has a more fatal course and becomes chronic and causes a tumour-like lesion [1,2,8]. Of course, a polymerase chain reaction (PCR) study is used today to determine the subspecies of echinococcus.

People become infected by accidentally ingesting tapeworm eggs or by breathing them through the respiratory tract. The adult form lives in the small intestines of meat-eating animals such as dogs, wolves and foxes.

Hydatid cyst, which can cause death by forming cysts in the internal organs of humans such as liver, lung, spleen, and brain, is very common in animals in our country after ingestion of parasite eggs by mouth and respiration. Its incidence in the liver is 8% and *E. granulosus* is the causative agent in 11% of the cases [9]. Echinococcal cases, which we frequently encounter in young children and teens, occur in the brain below 1% [3,4]. Alveolar echinococcus presents with distant metastases and often exhibits tumour behaviour [7]. Echinococcus alveolaris, which developed previously in the liver, can also metastasize to the central system at a rate of 5% [12]. Symptoms may vary depending on the location and the size of the cyst. Neurological symptoms occur when cysts in the brain also reach large sizes. In some cases,

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when it is perceived as a foreign body in the brain, it may cause the development of a host reaction. In such cases, a giant cell reaction can be observed in pathological examinations after surgery.

## Case report

An 83-year-old male patient was admitted to our clinic with complaints of recent forgetfulness and headache localized in the frontal region. No neurological deficit was detected in the physical examination of the patient. In the patient's anamnesis, there was a history of operation with the diagnosis of the hydatid liver cyst in 2005. Brain magnetic resonance imaging (MRI) examination with and without contrast was performed. In the contrast-enhanced T1 axial section of the patient's MRI, a heterogeneous mass lesion with a heterogeneous appearance and contrast enhancement was detected in the right frontal lobe, reaching a depth of approximately 4 cm and extending to the frontal horn of the lateral ventricle (Fig. 1A). Minimal peripheral vasogenic oedema was observed in the T1 axial section taken without contrast (Fig. 1B). The lesion was primarily thought to be a glial tumour. The images in the case were not overlapped with the classical hydatid cyst images. The patient was prepared preoperatively and taken to surgery. The mass was excised totally, macroscopically it was 2 × 4 cm in size and moderately hard on palpa-

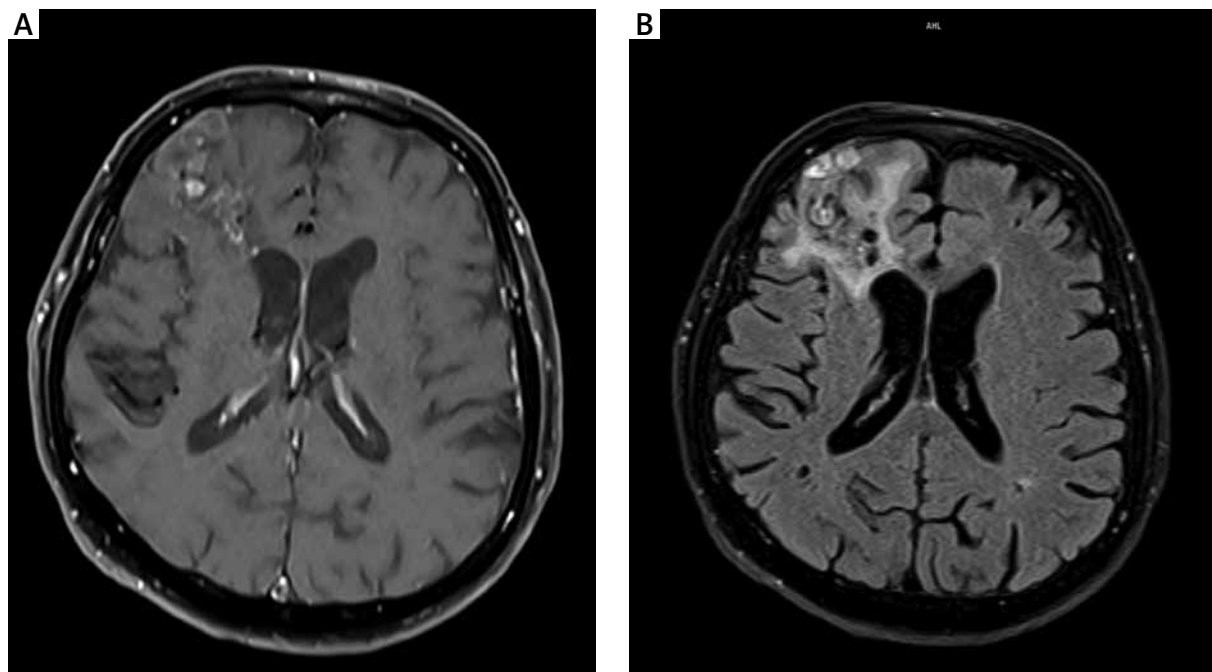
tion, containing densely thrombosed vasogenic structures. After the operation, the patient was discharged in good general condition. The specimen was sent to the pathology unit and histopathological examination was performed. As a result of histopathological examination, the diagnosis of the case was stated as parasitic infection. The patient's previous history of echinococcal surgery was considered in the pathological diagnosis. The patient was referred to the infectious diseases clinic and his treatment was started.

## Results of histopathologic examination

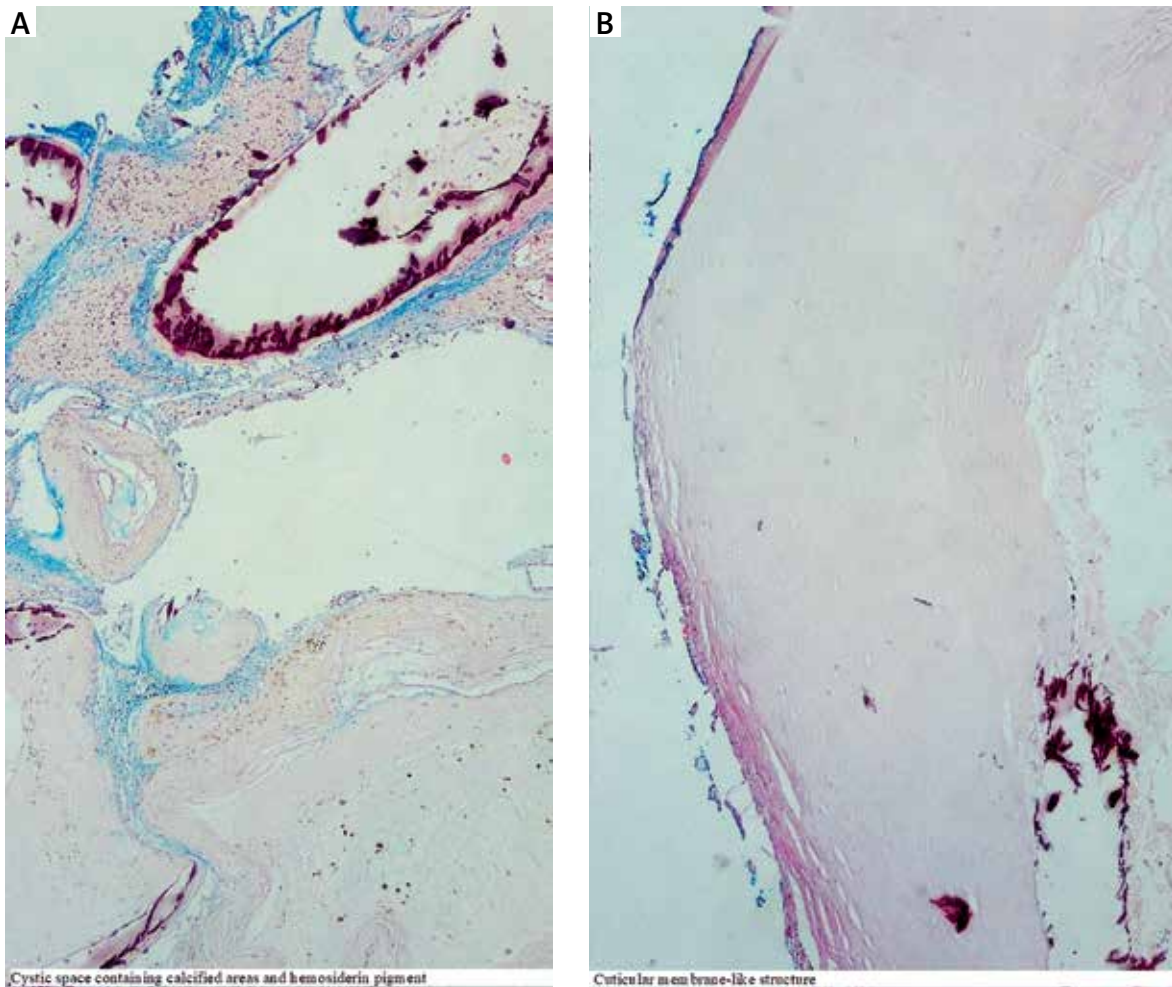
Occasionally cystic areas and connective tissue parts, hyalinization areas are available (Fig. 2). A flat epithelium of cystic spaces was observed in some areas. Membrane-like parts were seen in some areas (Fig. 2). Scolex or huglet was not found. Thrombosed enlarged vascular structures were seen between neuroglial tissues and areas of gliosis in sections, numerous hyalinized-walled vessels, areas of calcification in vessel walls are surrounded by macrophages loaded with hemosiderin, lymphocytes were observed (Fig. 3).

## Discussion

The epidemic regions of hydatid disease are Asia, Australia, and South America. It is more common than



**Fig. 1.** A) T1 axial section of the MRI, a heterogeneous mass lesion with a heterogeneous appearance and contrast enhancement. B) Minimal peripheral vasogenic oedema was observed in the T1 axial section taken without contrast.



**Fig. 2.** Cystic space containing calcified areas and hemosiderin pigment (HE 40×) (A) and cuticular membrane-like structure (HE 40-200×) (B).

Europe and North America. It is a zoonotic disease that is common in people involved in agriculture and farming in Turkey. *Echinococcus*, which is frequently encountered in the visceral organs, is most common in the liver, but also in the lung, kidney, spleen and musculoskeletal system. Cases in the brain are very rare and often occur in childhood [3,4].

On the other hand, Özgen *et al.*, in a study they conducted, reported that they operated on 3300 units at the Hacettepe University, Medical Faculty, Neurosurgery Clinic and found that 2.9% of the intracranial mass cases were cerebral hydatid cysts [6]. In this case, it is possible that a case that does not appear cystic and becomes chronic by creating a host reaction may be confused with a brain tumour.

Öztürk *et al.* previously presented a case imitating a cerebral tumour [7]. Since the patient's mass did not grow, he was not operated on and was only followed

up clinically. The fact that the patients had a previous history of a hydatid liver cyst helped make the diagnosis. In our case, the patient has a previous history of hydatid cyst surgery, too. The presence of a cerebral hydatid cyst can also be evaluated as the terminal phase of the disease.

Clinical symptoms that will cause the patient to apply are important in diagnosis. In cerebral echinococcus, of course, the size and location of the mass cause symptoms. The most common findings that we see are headache, nausea and vomiting, seizures, weakness in extremities, cranial nerve involvement and sensory disturbances. Our patient also presented with complaints of frontal localized headache and forgetfulness. Especially alveolar echinococcus is prone to metastasis and destructive. Serological tests and imaging are used in diagnosis. If surgery is performed, pathological examination is extremely important. On MRI, they are seen

as solitary and mostly as a single mass, suggesting a tumour. Although they often exhibit a cystic appearance, we observed that there was no cystic component in our case. The surrounding oedema can be seen and sometimes they show multiple mass appearance.

The treatment of cerebral echinococcal disease is surgery [10]. In our case, gross total excision was applied. The correlation should be studied by the clinic of infection diseases and should be followed up postoperatively. We do not know enough about the incidence of postoperative recurrence of the disease, gamma knife and radiotherapy were also applied in patients with a large mass appearance [11]. Anthelmintic drugs such as mebendazole and albendazole (benzimidazole derivatives) were used by the infection diseases department to supplement treatment [5]. These drugs are known to cross the blood-brain barrier and the hydatid cyst membrane [13]. It is recommended to use albendazole for at least 1 month and mebendazole for at least 3 months after surgery.

## Conclusions

If we live in an endemic area and the patient has a history, cerebral echinococcus should definitely come to mind in patients with brain tumours. Surgical removal is mandatory in cystic echinococcosis, particularly in case of the central nervous system location. Especially, it should be kept in mind that alveolar echinococcus has a malignant course and in particular, we should work in coordination with the infectious diseases clinic and make sure to follow up our patients postoperatively.

## Consent of patient

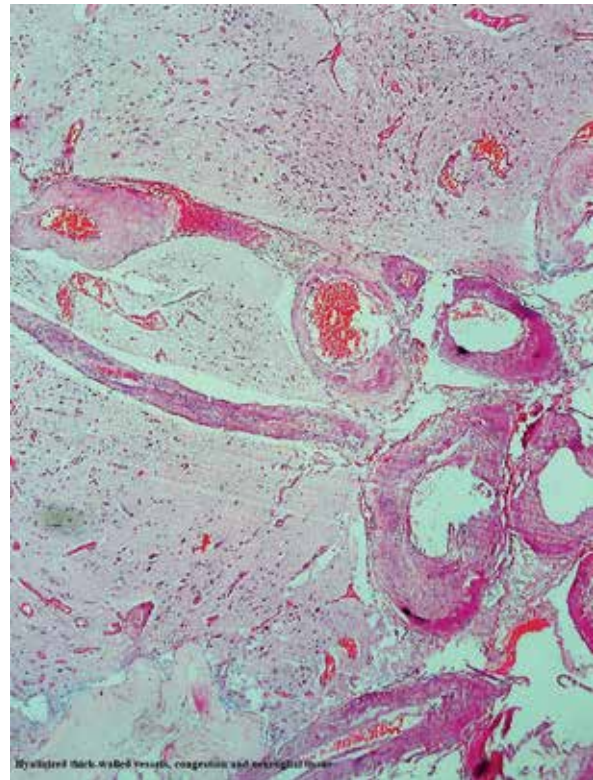
The findings of the patient mentioned in the study were included in the report with his knowledge and consent.

## Disclosure

The authors report no conflict of interest.

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**Fig. 3.** Hyalinized thick-walled vessels, congestion and neuroglial tissue (HE 40×).

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